

Climatological Data for July, 1910.
DISTRICT No. 10, GREAT BASIN.

ALFRED H. THIESSEN, District Editor.

GENERAL CLIMATOLOGICAL CONDITIONS.

The month of July was characterized by remarkably steady temperatures which averaged above normal for the district. No general excessively high temperatures were reported, and there was no frosty weather, except at a few of the more elevated stations. The precipitation averaged above normal, and the drought, which had extended from March 1, was broken during the month when good showers fell in most localities. These showers were sufficient to benefit vegetation, and raise the water to some extent in the streams. There was generally sufficient water for irrigation, but at the end of the month it was getting low and was much lower than it had been for many years.

TEMPERATURE.

This month takes rank as one of the warmest months of its name on record, the mean being 72.0°. In Utah the average temperature for the month was exceeded in only three previous years, and in Nevada in only five. The mean temperature ranged from 63.6° at Evanston in southwestern Wyoming to 83.2° at Jean in southern Nevada. The highest mean temperatures occurred in the valleys of Utah and in western Nevada, and the lowest means were confined to the more elevated portions of the district. The record for the month shows a remarkable regularity in temperature, there being no period of widespread high or low temperatures. As a rule, the first six days of the month were coolest. The temperature then rose gradually, with some local exceptions, culminating in two periods of high temperature, the 18th and 25th.

The highest temperature for the district was 110° on the 11th at Jean in southern Nevada. Other high maximum temperatures were 108° on the 26th, at Battle Mountain, Nev., and 105°, on the 14th, at Corinne, Utah. There were 22 stations which reported maximum temperatures of 100° or more; while only three stations reported maximum temperatures below 90°.

Excepting at five stations, the minimum temperatures occurred on the first six days of the month. Only 11 stations reported minimum temperatures of 32° or below. The lowest temperature recorded was 28° on the 5th at Cobre and Potts, Nev.

PRECIPITATION.

As a rule, the precipitation in July is very light in the Great Basin; but during the present month it was unusually heavy in most localities. The greatest amounts fell along the western slope of the Wasatch Mountains in Utah and at scattered places in Nevada. The greatest excesses occurred in southern Utah, and the greatest deficiencies in the Oregon area and in northern Nevada.

The greatest monthly amount was 3.41 inches at Pañguitch Lake, Utah, and the greatest 24-hour amount 1.85 inch on the 13th at Jean, Nev. One of the heaviest showers on record at Reno, Nev., occurred on the 17th, where from 4:20 p. m. to 7 p. m. 0.82 inch fell; in 5 minutes 0.15 inch, and in 30 minutes 0.54 inch fell.

The first decade was very dry, only a few local showers having been recorded. The wettest periods of the month centered about the 15th and the 27th, except in the California area, where most of the rain fell on the 17th, 18th, and 19th; and in the Oregon area no rain fell after the 21st.

MISCELLANEOUS.

Sunshine during the month was abundant throughout the district. At Salt Lake City, Utah, 73 per cent of the possible amount was recorded.

There were, on the average, 4 rainy, 15 clear, 10 partly cloudy, and 6 cloudy days.

The highest wind reported was 56 miles an hour from the southwest on the 3d at Modena, Utah.

INFLUENCE OF SOIL MULCHES IN CHECKING EVAPORATION.

By DON H. BARK, Office of Irrigation Investigations, Boise, Idaho.

Irrigation water has always been subject to enormous losses before it reaches the farmers' fields, and it has long been known that but a small part of the amount actually diverted from the streams is used beneficially by the crops. But how to cut down this loss and thus make our available water supply cover and produce maximum crops on more land has long been the problem. These losses occur from seepage and evaporation from the ditches before the water reaches the field and from evaporation and waste afterward. The Irrigation Investigation Division of the United States Department of Agriculture has been studying these various losses and the best means of eliminating them for the past ten years, and the experiment herein described is given in detail, along with many others, in Office of Experiment Station Bulletin No. 177.

In conducting experiments on evaporation losses from the soil, the greatest difficulty is in securing natural normal conditions. Laboratory tests with small amounts of soil are easily made, but the evaporation from soils and the artificial surroundings of a laboratory as regards temperature, humidity, and wind movement are likely to be quite different from that from similar soils in the open, so it was decided at the outset that all experiments along these lines should be carried out with large amounts of soil and in the open field.

The plan followed in determining the rate and amount of evaporation from the soil was to remove about 1,200 pounds of soil from the field and place it in a water-tight cylindrical vessel as nearly as practicable in its natural position, and by periodical weighings to determine the loss of moisture from it. The equipment which was used consists of 8 water-jacketed galvanized iron tanks 2 feet in diameter and 4 feet high. The outer tanks are set in the ground in a typically located spot and the inner tanks are carefully filled with 4 feet of soil compacted to its normal density by tamping, after which they are weighed and lowered into the outer tanks which have previously been partly filled with water.

Water equivalent to 4 or 6 inch irrigation is then applied to each tank and the influence of wind, shade, mulches, and cultivation upon evaporation are carefully determined by figuring these factors and weighing the tanks twice each week.

Tank equipments are now installed and have been operated for the past two years in the following places: Bozeman, Mont.; Williston, N. Dak.; Reno, Nev.; Sannyside, Wash.; Davis, Cal.; and Caldwell, Idaho. These localities cover a wide range of climatic conditions, and with an equipment flexible enough to carry on various experiments in the evaporation from the soils a large number of valuable results are looked for in the next few years. The results which were obtained up to January, 1907, are given in Office of Experiment Station Bulletin No. 177, and other bulletins will be issued later on giving the results from a wider range of experiments which have been carried on since that time. The experiment herein described is taken from that bulletin and was carried on at Riverside, Cal., during June and July, 1907, for the purpose of determining the amount of evaporation from orchard soils with different depths of soil mulch, and to compare the effect of different depths of mulch upon the evaporation. Fourteen water-jacketed tanks were

used, being filled with soil from block 58 of the Arlington Heights Fruit Company Canal, and after being put into position were divided into the following groups:

First group, Nos. 1 and 3, no mulch.

Second group, Nos. 2, 4, and 10, 4-inch mulch.

Third group, Nos. 5, 7, and 11, 8-inch mulch.

Fourth group, Nos. 6, 8, 12, and 14, 10-inch mulch.

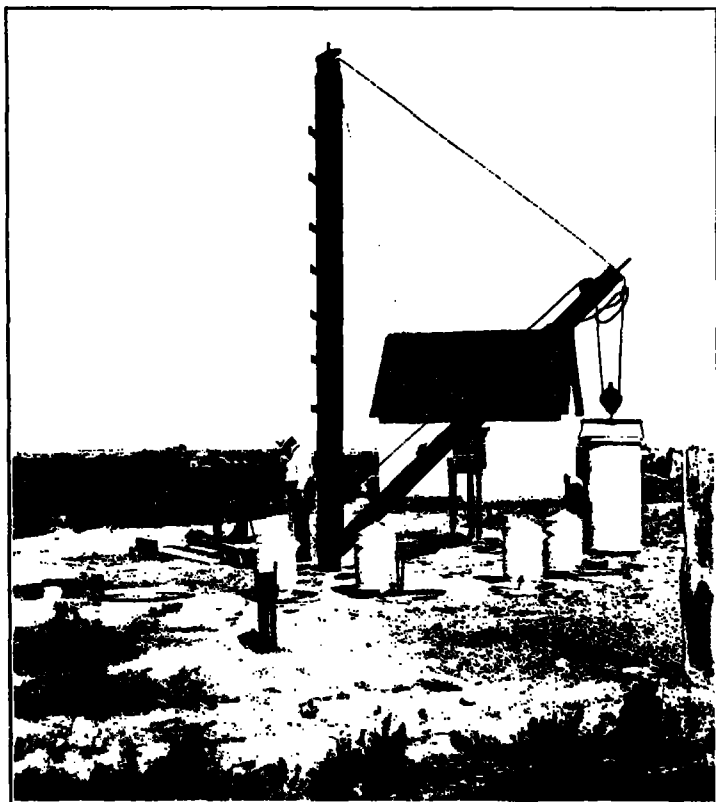


FIG. 1.—Soil evaporation apparatus, Caldwell, Idaho.

An amount of water equal to a 6-inch irrigation was then applied to each one of the tanks. In the first group the water

was applied on the surface of the soil, while in the remaining groups the mulch was not put on until after the water was applied. When the soil in the tanks had absorbed the water a dried soil mulch of the required thickness was spread over the top and the initial weight of the tanks was obtained. All tanks were weighed five times during the experiment, which lasted 14 days. The results showed that the comparative losses in 14 days after irrigation, from a soil without mulch and from soils protected by 4, 8, and 10 inch mulches, were in the ratio of 45.6, 12.9, 5.3, and 1. They also showed that the large loss from unprotected soils which had been irrigated as well as the comparatively small losses from soils covered by a mulch take place, for the most part, during the first two days after the water is applied, and the decrease in evaporation is very rapid as the surface soil dries out. Although the amount of water evaporated from the different tanks was quite different for any one day, yet the evaporation from all four sets of tanks obeyed the same law in the rapid rate of decrease toward the end of the experiment, which shows more clearly than words can express the very urgent necessity of applying the water at such depths that the surface soil will remain dry in order to lessen the waste of water by evaporation.

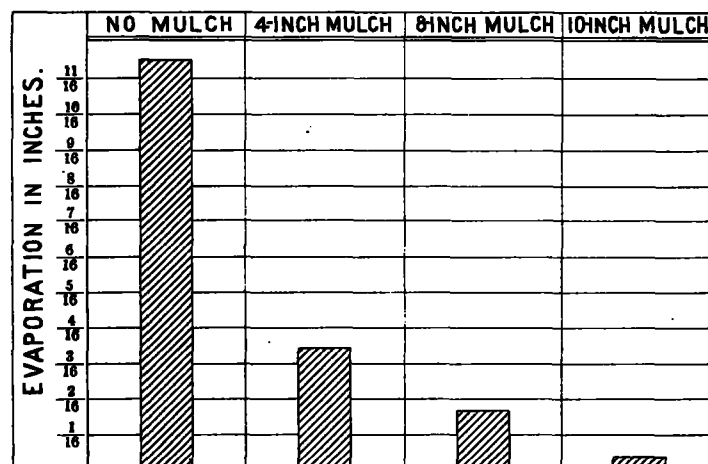


FIG. 2.—Diagram showing evaporation from soils protected by soil mulches of different depths.